

**FACTORS INFLUENCING CONSUMER PURCHASE INTENTION OF
DIETARY SUPPLEMENT PRODUCTS IN PENANG ISLAND**

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FAKTOR-FAKTOR MEMPENGARUHI NIAT PEMBELIAN SUPLEMEN PEMAKANAN DI KALANGAN PENGGUNA DI PULAU PINANG

ABSTRAK

Walaupun sokongan klinikal tentang keperluan suplemen pemakanan untuk kesihatan adalah terhad, pembeliannya semakin meningkat. Tujuan kajian ini adalah untuk mengkaji faktor-faktor yang mempengaruhi pembelian suplemen pemakanan di kalangan pengguna di negeri Pulau Pinang berdasarkan model *Theory of Planned Behaviour* (TPB). Seramai 367 orang pengguna kedai farmasi dan pasar raya besar telah menyertai kajian ini. Berdasarkan analisis statistik, peranan sikap berbeza daripada model asalnya, sikap memainkan peranan baru sebagai pengantara dalam konteks pembelian suplemen pemakanan tersebut. Keputusan kajian menyimpulkan bahawa norma subjektif, kepentingan harga dan kesedaran kesihatan mempengaruhi niat pembelian suplemen pemakanan secara tidak langsung melalui pembentukan sikap. Selain daripada itu, terdapat perbezaan yang ketara di antara pengguna dan bukan pengguna suplemen pemakanan dalam kesemua pembolehubah kajian, menjelaskan 71.5% varians. Pengguna suplemen pemakanan lebih berniat untuk membeli suplemen pemakanan, bersikap lebih positif terhadap suplemen pemakanan, lebih bertekanan sosial untuk beli, lebih bertanggungjawab ketersediaan produk, lebih mementingkan harga dan mempunyai tahap kesedaran kesihatan yang lebih tinggi berbanding dengan bukan pengguna. Oleh itu, bagi menggalakkan kehidupan yang sihat secara semulajadi, pembentukan sikap pengguna adalah penting. Pihak penguatkuasa polisi, pakar kesihatan, pendidik, ahli kajian dan pihak industri harus bertanggungjawab dan terus bekerja keras untuk menyalurkan pengetahuan yang betul tentang suplemen pemakanan dan kehidupan sihat kepada pengguna.

FACTORS INFLUENCING CONSUMER PURCHASE INTENTION OF DIETARY SUPPLEMENT PRODUCTS IN PENANG ISLAND

ABSTRACT

Purchase of dietary supplement products is increasing despite the lack of clinical evidence to support health needs for consumption. The purpose of this cross-sectional study is to examine the factors influencing consumer purchase intention of dietary supplement products in Penang based on Theory of Planned Behaviour (TPB). 367 consumers were recruited from chain pharmacies and hypermarkets in Penang. From statistical analysis, the role of attitude differs from the original TPB model; attitude played a new role as the mediator in this dietary supplement products context. Findings concluded that subjective norms, importance of price and health consciousness affected dietary supplement products purchase intention indirectly through attitude formation, with 71.5% of the variance explained. Besides, significant differences were observed between dietary supplement products users and non-users in all variables. Dietary supplement product users have stronger intention to purchase dietary supplement products, more positive attitude, with stronger perceived social pressures to purchase, perceived more availability, place more importance of price and have higher level of health consciousness compared to non-users. Therefore, in order to promote healthy living through natural ways, consumers' attitude formation towards dietary supplement products should be the main focus. Policy maker, healthcare providers, educators, researchers and dietary supplement industry must be responsible and continue to work diligently to provide consumers with accurate dietary supplement products and healthy living information.

Chapter 1

INTRODUCTION

1.1 Introduction

Recently, there has been much concern in the role of nutrition in maintenance of health and prevention of chronic diseases such as cancer, osteoporosis and coronary heart disease. Accordingly to Blendon, DesRoches, Benson, Brodie and Altman (2001), our community have shown much attention and concern on the development of chronic diseases as a result of our sedentary lifestyles. Therefore, dietary supplement products have received greater interest and more popular now.

Dietary supplement is defined, under the Dietary Supplement Health and Education Act of 1994 in the United States, as a product (other than tobacco) which is ingested and contains a dietary ingredient intended to supplement the diet. These dietary ingredients include vitamins, minerals, herbs or other botanicals, amino acids, substances such as enzymes, organ tissues, glandular, metabolites, extracts or concentrates (FDA, 1994). According to the Ministry of Health Malaysia, dietary supplement products are classified as products intended to supplement the diet, in the form of pills, capsules, tablets, liquids or powder and not represented as conventional food (ACCSQ, 2006).

The dietary supplement market is one of the world's fastest growing industries. In the year 2006, market for vitamins and dietary supplements is worth

52.2 billions USD (Euromonitor, 2008). In the National Health and Nutrition Examination Survey (NHANES III) 1999 – 2000, 52% of adults were reported taking dietary supplement products in the past month. Also, it is indicated that the overall prevalence of dietary supplement usage is 40%, compared to prevalence rates of 35% in NHANES II (1976 – 1980) and 23% in NHANES I (1971 – 1975) (Radimer, Bindewald, Hughes, Ervin, Swanson & Picciano, 2004).

This is supported by several other studies indicated that 21% – 55% of the US population use dietary supplement products. The difference of percentage is depending on the definitions of supplement use and populations studied (Nesheim, 1999; Balluz, Kieszak, Philen & Mulinare, 2000; Blendon et al., 2001). As dietary supplement intake among consumers has increased substantially in the past two decades, it is becoming an alarming issue from a public health perspective, due to lack of scientific proof and documentation for its safety, interactions and effectiveness against specific diseases and conditions.

1.2 Background

Given the substantial growth in this healthcare industry, particularly in dietary supplement products (Euromonitor, 2008), there is a need to review the circumstances and consumers' purchase behavioural intention for the domestic dietary supplement markets. This is crucial to provide clearer information, to understand customers' real needs and to serve them well, in order to maintain market competitiveness.

1.2.1 Dietary Supplement Market in Malaysia

Malaysia is a relatively healthy country where its population is relatively health conscious (Euromonitor, 2008). With better education and health awareness through media exposure, Malaysians are leading to a better quality of life through the increasingly awareness about their health status, general well being and self image. Healthcare products are seen as quick options to maintain and sustain their general health and well being. In fact, consumers nowadays are willing to spend a little bit more on dietary supplement products as long as they believe their health can be improved (Euromonitor, 2008). This has created a new paradigm of well being where individuals are seeking for alternatives rather than focusing on natural ways of improving their health such as exercises, eating healthy food and eliminating other bad behaviours such as smoking and drinking alcohol beverages.

Dietary supplements are available in many forms, such as tablets, chewable tablets, caplets, capsules, softgels, powders, liquids, or effervescent form (FDA, 1994). These dietary supplements are widely available and accessible from clinics, pharmacy stores such as Guardian, Watson's, Caring and Apex; healthcare product outlets such as GNC, Himalaya or Nature's Farm; Chinese medical halls, supermarkets / hypermarkets or even direct selling agents such as Elken, Amway and Cosway (Ghazali, Mutum & Lee, 2006). Given the significant globalization challenges and increasing competition, the wider acceptances from consumers and availability have been the underlying driver for strong growth in the dietary supplements market.

Dietary supplement market in Malaysia is huge and it is expected to grow significantly as well as the economic contribution from this sector is enormous. For instance, in 2002, it was reported that Malaysians spent an average of US\$ 17.30 a month on health supplement products (Ahmad, 2002). In addition, different pharmacies or outlets may have dietary supplement products price differences, thus, purchase intention may be varies. Besides, the Malaysian over-the-counter healthcare shows moderate growth by 18% to reach RM 1283 millions by 2008 (Euromonitor, 2008). Furthermore, it is estimated that consumer expenditure on health goods and medical services to be RM 4829.9 millions and RM 5549.5 millions by the year of 2010 and 2015 respectively (Euromonitor, 2008). This phenomenon will continuously to grow as the aging population in Malaysia also increase.

According to Maslow (1970), human behaviour is motivated by a set of basic needs. These needs are arranged according to their importance for survival, the most basic needs such as food, water, shelter and clothing constitute the lowest level of needs hierarchy. These needs must be satisfied before other higher needs become important. For example Table 1.1 shows that the increment for consumer expenditure in health goods & medical services (481.92%) is greater from year 1990 to 2010 as compare to the basic needs, which are food and non-alcoholic beverages (244.50%), clothing and footwear (266.83%) and housing (236.31%). This indicates that health goods inclusive of dietary supplement products are regarded as one of the important aspect of consumer needs. This aligns with the Maslow Hierarchy model where their basic need is being satisfied, they will move to upper level of needs rather than food that they need more.

Table 1.1*Malaysian Consumer Expenditure by Purpose 1990 – 2015*

RM million	1990	1995	2000	2005	2010	2015
Food & non-alcoholic beverages	13483	24073	33428.5	40617.8	46448.4	52957.6
Alcoholic beverages & tobacco	1397	2689	3804.7	4808.7	5635.3	6538.2
Clothing & footwear	2018	3661	5056.8	6505.2	7402.6	8366.7
Housing	12315	23115	31674.7	38389.1	41416.3	42745.8
Household goods & services	2809	5642	7486.8	9665.8	10655.8	11566.2
Health goods & medical services	830	2270	3306	4201.7	4829.9	5549.5
Transport	11077	16439	23220.7	29213.1	31850.9	35383.9
Communications	1365	2456	4116	5478.7	6593.8	7630.6
Leisure & recreation	3181	5303	6189.2	7425.5	8408.3	9168.7
Education	858	1656	2628.7	3370.5	4073.8	4924.4
Hotel & catering	9784	15625	19399.8	23729	28328.9	29876.6
Misc goods & services	3143	6905	6783.2	8190.5	9294.5	9892.3
Total	62262	109834	147095	181596	204939	224601

Source: National Statistical Office / OECD / Eurostat / Euromonitor International (Euromonitor, 2008)

Demand growth for over-the-counter healthcare such as the dietary supplement products is likely to be sustained by a better economic performance, growing consumer awareness and a wider product publicity. Hence, interest towards dietary supplement products buying behaviour has increased among policy makers, marketers and researchers. They devoted substantial attention to the need for assessment of consumer behaviour and to the application of dietary supplement product labelling.

1.2.2 Behavioural Intention

According to Conner, Kirk, Cade and Barrett (2001), reasons for individuals to consume dietary supplement products are often complex as it combining social, psychological, knowledge and economic factors. It was supported by Fiske and Taylor (1991) and Norman and Conner (1996) that most psychological research has focused on individual's perceptions of the influences on their choices and engaged social cognition approach to assess consumer behaviour. Theory of Planned Behaviour (TPB) (Ajzen, 1991) is one of the widely used social cognition models, has been applied in this study to understand the health behaviour of consumers towards dietary supplement products intake and to support the development of theoretical framework in this research. It focuses on individual motivational factors as determinants of the likelihood to perform or not perform a specific behaviour (Montano & Kasprzyk, 2002).

TPB suggested that behaviour is best predicted by intention to perform the behaviour (Ajzen, 1991; Armitage & Conner, 2001). Intentions are influenced by attitudes towards the behaviour, subjective norms and perceived behavioural control. Attitudes represent an individual's overall evaluations of the behaviour as positive or negative. Subjective norms assess the perceived social pressures to perform or not perform a particular behaviour; whereas perceived behavioural control is the individual's perception of the extent to which performance of the behaviour is easy or difficult for that individual. Perceived behavioural control is also held to influence behaviour directly when perceptions of control match actual control (Armitage & Conner, 2001). Perceived behavioural control can be further divided into perceived

self efficacy and perceived controllability (Ajzen, 2002). Hence, two variables, perceived availability and importance of price are derived in this study. On the other hand, TPB assumes that all other factors, such as environmental influences and demographics do not independently contribute to explaining the likelihood of performing behaviour (Montano & Kasprzyk, 2002).

In summary, to predict whether or not a person intends to carry out an action, it is crucial to identify whether or not the person is favour in doing it (attitude), how much the person feels social pressure to do it (subjective norms) and whether or not the person feels in control of the action (perceived behavioural control). By changing these three predictors, it will increase the chances of the person's intention to carry out the action and therefore increase the chances of the person actually doing it. Present study aims to identify factors influencing the dietary supplement products purchase intention among consumers in Penang with the application of TPB model. Apart from that, additional independent variables were also being tested in this study.

1.3 Problem Statement

Dietary supplement has become a timely topic today in medical research, business and legislative area. The use of these products is high across all ethnic groups, usage tended to increase with age, education and physical activity levels. In general, subjects with healthier lifestyles are more likely to use dietary supplements (Foote, Murphy, Wilkens, Hankin, Henderson & Kolonel, 2003). In most cases, dietary supplement demand is being driven by customers who have expressed a strong need for the benefits obtained from dietary supplements and the desire to

adopt or maintain a healthy lifestyle (Berry, 2004). Despite the great impact that this health conscious consumers have had on the market, there has been very little research in this aspect. Understanding dietary supplement products purchase intention is the pre-requisites for healthcare professionals in providing consumers with accurate dietary supplement information and helping them to recognize and avoid misinformation.

Dietary supplements' safety issues such as bioavailability, bioequivalence and validation in vitro and animal studies that accurately reflect in human condition are scarce (Yetley, 2007). According to Yen (1999), dietary supplements are not always healthful to the body and there are always potential adverse effects concerned (Woo, 2007). Moreover, the Position of the American Dietetic Association has stated that optimal health and disease prevention is obtained through choosing a wide variety of foods wisely; and no recommendations for dietary supplements have been established (ADA, 2001, 2005). Throughout the years, dietary supplements usage among individual is increasing (Radimer et al., 2004), despite the lack of supportive evidences indicating their need to meet nutritional requirement in the majority community. Therefore, consumers' dietary supplement purchase intention has been part of healthcare providers' focus in the process of promoting healthy lifestyles.

According to Zeisel (2000), the use of dietary supplement products might involve excess exposure of nutrient or chemical substances that a normal individual normally require. Furthermore, dietary supplements may have potentially beneficial or harmful interactions with drugs (ADA, 2005). But as we observed, the contradiction is that those who are consuming dietary supplements may be those who

are least likely to need them (Kirk, Cade, Barrett & Conner, 1999). According to Ghazali and colleagues (2006), out of 91.8% of dietary supplements users, 66.8% are regular users. Hence, this is an alarming scenario in our healthcare system. There is a dire need to know the reasons why consumers need to purchase dietary supplements. What are the factors that influence their dietary supplements purchase intention? There is no doubt that prevention is always better than cure, but it should be in a natural and healthy ways.

1.4 Research Objectives

Several studies have examined lifestyle and demographic associations with dietary supplement use (Nayge & Reed, 1999; Messerer, Johansson & Wolk, 2001), but there is only a few that focus on dietary supplement products purchase intention. Theory of planned behaviour is a widely used social cognition model, which can be applied in dietary supplement research (Corner et al., 2001). Thus, this study explores on consumers' attitude, subjective norms, perceived behavioural control (perceived availability and importance of price) and consumer's self identification as an indicator of health consciousness that predicts users' dietary supplement products purchase intention. The objectives of this study are:

1. To examine the influence of attitude towards intention to purchase dietary supplement products.
2. To examine the influence of subjective norms towards consumers' attitude to purchase dietary supplement products.

3. To examine the influence of perceived behavioural control (perceived availability) towards consumers' attitude to purchase dietary supplement products.
4. To examine the influence of perceived behavioural control (importance of price) towards consumers' attitude to purchase dietary supplement products.
5. To examine the influence of consumers' health consciousness towards consumers' attitude to purchase dietary supplement products.
6. To examine whether the relationship between subjective norms, perceived behavioural control (perceived availability and importance of price), health consciousness and consumers' intention to purchase dietary supplement products are mediated by attitude.
7. To examine the differences between dietary supplement products users and non-users in relations to intention, attitude, subjective norms, perceived behavioural control (perceived availability and importance of price) and health consciousness that influence their purchase.

1.5 Research Questions

Based on the research objectives, there are several questions that will be the concern of this current research, as stated below:

1. Does attitude influence consumers' intention to purchase dietary supplement products?
2. Does subjective norms influence consumers' attitude to purchase dietary supplement products?

3. Does perceived availability influence consumers' attitude to purchase dietary supplement products?
4. Does importance of price influence consumers' attitude to purchase supplement products?
5. Does consumers' health consciousness influence consumers' attitude to purchase dietary supplement products?
6. Does the relationship between subjective norms, perceived availability, importance of price, consumers' health consciousness and dietary supplement products purchase intention mediated by consumers' attitude?
7. Are there any significant differences between dietary supplement products users and non-users in relations to intention, attitude, subjective norms, perceived availability, importance of price, and health consciousness?

1.6 Definition of Key Terms

This section provides definition for some of the terminologies that are frequently used in this study:

Table 1.2
Definition of Key Terms

Terms	Definition
Intention	Plans to act in a particular way and represent the motivation toward the behaviour.
Attitudes	Overall evaluations of the behaviour as positive or negative for an individual.
Subjective norms	Assess perceived social pressures to perform or not perform a particular behaviour.

Perceived behavioural control	Individual's perception of the extent to which performance of the behaviour is easy or difficult.	Ajzen (1991)
Users	Those who use dietary supplement products in the past one year.	
Non-users	Those who do not use dietary supplement products in the past one year.	Ghazali et al. (2006)
Health consciousness	The degree to which individuals focus on their health through states of attention to self relevant cues that are reflected in both cognition and affect.	Dutta-Bergman (2004)

1.7 Significance of Study

In United States and European countries, several studies had examined the associations of lifestyle and demographic with dietary supplements use (Messerer et al., 2001; Foote et al., 2003; McNaughton, Mishra, Paul, Prynne & Wadsworth, 2005). According to them, dietary supplement products usage tended to increase with healthier lifestyles, age, education and physical activity levels. In Malaysia, there is still not much focus in the healthcare industry and not many studies look into the dietary supplements products. Therefore, the main focus of this study is to produce supportive data about the factors influencing consumers' intention to purchase dietary supplement products, using consumers' attitude as the mediator to examine the independent variables towards intention to purchase.

The use of TPB model to explore dietary supplements purchase intention can be considered as useful and practical in the context of study. In this approach, the theoretical framework is modified from TPB model (Ajzen, 1991), whereby

additional independent variable, consumer's health consciousness is incorporated to predict consumers' intention to purchase dietary supplement products. Therefore, this study is anticipated to provide further behavioural intention information in view of the extensive use of dietary supplement products and growing healthcare industry.

From the marketing perspective, the findings of this study is important to provide indepth information on dietary supplements purchase intention. With a better understanding of the consumers, it helps marketers to serve their customers better and to assists them to satisfied their real needs (Kotler & Armstrong, 2006). Marketers may critically develop competitive marketing strategies that focus on health awareness creation and to provide accurate dietary supplement products information to consumers (Ghazali et al., 2006). Therefore, the findings provide significance managerial implication and may become practical guidelines for dietary supplement marketers who want to stay ahead of their competitors, equipped with competitive advantages in the global climate of change.

Moreover, an understanding of the consumers' intention towards dietary supplements is crucial in light of public health issues surrounding community health awareness programme and dietary recommendations for the general public (McNaughton et al., 2005). As for our government, it provides references to policy makers to implement dietary supplements related act, advertisement rules and regulations, label claims, health education and community health campaign to increase health awareness level. According to Glanz and colleagues (2002), health education is recognized as a mean to meet public health goals and to improve the

success of health and medical interventions. Thus, this study would help them to allocate resources wisely and to make better implementation decisions.

1.8 Organization of Remaining Chapters

This report consists of five chapters. The first chapter illustrates dietary supplement market and behaviour intention, following by the problem statement, research questions and research objectives. Literature reviews, theoretical framework and hypotheses formulation are presented in chapter two. Meanwhile chapter three outlines the research methodology. Chapter four reports the results, data analysis and statistical interpretation. Chapter five laid the conclusion with discussion and implications for the dietary supplement industry. Furthermore, research limitations and recommendations for future research will also be covered.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

This study aims to identify factors influencing dietary supplement products purchase intention among consumers in Penang with the application of Theory of planned behaviour (TPB; Ajzen, 1991) model. This research examines attitude as the mediator to examine the independent variables towards intention to purchase dietary supplements. Besides, additional independent variable, namely consumers' health consciousness will be tested on intention toward dietary supplement products purchase. Following the foreword of health behaviour, a review of the previous TPB research will be discussed, continued by some dietary supplement literatures. Meanwhile theoretical framework and hypothesis are presented in the last section of this chapter.

2.2 Health Behaviour Concepts

Gochman (1997) defined health behaviour as *“those personal attributes such as beliefs, expectations, motives, values, perceptions and other cognitive elements; personality characteristics, including effective and emotional states and traits; and overt behaviour patterns, actions and habits that relate to health maintenance, to health restoration and to health improvement”* (pg 3).

His definition is much broader, but similar, compared to Kasl and Cobb (1966). Kasl and Cobb defined health behaviours as “*any activity undertaken by a person believing himself to be healthy for the purpose of preventing disease or detecting it at an asymptomatic stage*” (pg 246). The study of behaviours that influence health and the factors determining which individuals will and will not perform such behaviours has become a key area of research. Individuals can make contributions to their own health through adopting particular health enhancing behaviours such as exercise and avoiding health compromising behaviours such as smoking (Conner & Norman, 2005).

Researchers have identified that health behaviours are attributable to individuals’ socio-demographic backgrounds (Chowdhury, Balluz, Okoro & Strine, 2006) and social cognitive variables, such as attitudes and perceptions of health risks (Ajzen, 1991). Mainly dealing with cognitive aspects of behaviour, TPB suggested attitudes and the behaviour relationship in variety of research areas, such as psychology, business and health behaviours (Godin & Kok, 1996; Conner, et al., 2001; Tarkiainen & Sundqvist, 2005). Despite reviewing researches related to Social Cognitive Theory, Theory of Reasoned Action, Health Believe Model and Protection Motivation Theory, Armitage and Conner (2000) suggested that TPB is superior to the other theories in predicting intentions and behaviours because more variance in intentions and behaviours has been accounted. Armitage and Conner (2001) had carried out an extensive meta-analysis of this theory with comprehensive analysis. They reviewed 185 independent TPB research and found that TPB variables respectively explained 39% and 27% of the variance in intentions and behaviours.

2.3 Theory of Planned Behaviour

Theory of Planned Behaviour (TPB; Ajzen, 1991), a widely used social cognition model, is an extension of the Theory of Reasoned Action (TRA) which has been introduced by Fishbein and Ajzen in 1975, due to the original model's limitation in dealing with behaviours. TRA formulates that attitudes and subjective norms determine an individual's intentions to perform a given behaviour and intentions to perform behaviour correlate with actual behaviour (Fishbein & Ajzen, 1975). TRA has provided strong support for predicting volitional behaviours that are not purely under an individual's volitional control (Ajzen, 1991). Thus, TPB suggests that behaviour is predicted by intentions to perform the behaviour with the addition of perceived behavioural control to TRA model when behaviour is not under complete an individual's volitional control (Ajzen, 1991).

Predicting behaviour is the ultimate goal of TPB, same as TRA, both theories only predict behaviour but do not explain the behaviour (Conner & Sparks, 2005). According to Ajzen and Fishbein (2005), TPB assumed that attitudes guide behaviour and it does not explain why attitudes guide behaviour (Petty & Caccioppo, 1986). Moreover, Bentler and Speckart in 1979 suggested that TPB does not explain spontaneous, impulsive, habitual or mindless behaviours because those behaviours might not be voluntary, as performing such behaviours does not entail any conscious decision making process.

2.3.1 Intention

According to TPB (Ajzen, 1991), human behaviour is determined by intention and perceived behavioural control (PBC). Behaviour is influenced by the intention to perform the behaviour. According to Conner and Norman (2005), intention is the proxy determinants of behaviour. Intentions represent a person's conscious motivation or decision to exert effort to perform the behaviour. Intentions themselves are influenced by attitudes towards the behaviour, subjective norms and perceived control over the behaviour. The weight for each construct is determined empirically and varies across different behaviours. The three constructs are the results of the behavioural beliefs, normative beliefs and control beliefs.

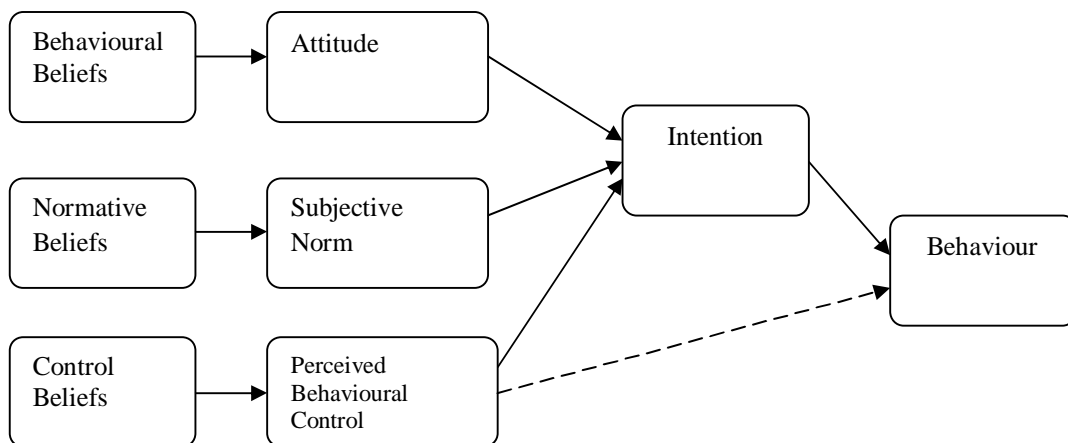


Figure 2.1. Theory of planned behaviour (Ajzen, 1991)

Underlying each of these factors are sets of beliefs. Attitudes are held to be based upon beliefs about the likely outcomes of the behaviour (behavioural beliefs), normative beliefs refer to individuals' opinion of social pressure or their important others' expectation as to whether they should perform or not perform the behaviour

(Fishbein & Ajzen, 1975). Motivation to comply is the perceived pressure that individuals feel toward the behaviour. Depends on the behaviour, the important others are those individuals perceived to be important, such as family members, friends and roommates (Conner & Sparks, 2005).

2.3.2 Perceived Behavioural Control

The difference between TRA and TPB lies in the control component of TPB (Conner & Sparks, 2005). As mentioned earlier, TRA assumes that most human social behaviours are under volitional control and thus can be predicted from intentions alone. However, rest assured there are circumstances which individuals do not have complete control. Hence, perceived behavioural control was added to TPB to predict non-volitional behaviours (Ajzen, 1991). Perceived behavioural control was originally defined as perception of the ease or difficulty to perform the behaviour of interest (Ajzen, 1991). Referring to Conner and Sparks (2005), perceived behavioural control is modelled by the combination of the likelihood of occurrence of a control factor and the perceived power of that control factor. Control beliefs refer to perceptions of various control factors that may facilitate or inhibit performance of the behaviour, whereas perceived power refer to the likelihood that a control factor may prevent an individual from performing behaviour.

Behaviour is the manifest, observable response in a given situation with respect to a given target, and intention is an indication of an individual's readiness to perform a given behaviour (Fishbein & Ajzen, 1975). The relationship suggests that individuals are likely to perform behaviour if they intend to do so. The relationship

between perceived behavioural control and behaviour indicates that individuals will engage in behaviour when they perceive that they have control over the given behaviour and they will be prevented from performing the behaviour if they have no control. The control factor include internal factors such as information, personal deficiencies, skills, abilities and emotions; and external factors such as opportunities, dependence on others and barriers (Conner & Norman, 2005).

The central factor in the TPB is the individual's intention to perform a given behaviour. In the earlier studies of TRA and its extension, the TPB, has been used to examine a wide variety of different behaviours (Armitage & Conner, 2001), several of which are food related, such as organic vegetable consumption (Sparks & Shepherd, 1992), organic food buying (Tarkiainen & Sundqvist, 2005), reduction in fat intake (Paisley & Sparks, 1998; Armitage & Conner, 1999), skimmed milk consumption (Raats, Shepherd & Sparks, 1995) and healthy eating (Povey, Conner, Sparks, James & Shepherd, 1999). Other areas of application include intentions to buy environmental friendly products (Kalafatis, Pollard, East & Tsogas, 1999), smoking cessation (Norman, Conner & Bell, 1999) and exercise (Godin, Valois, Jobin & Ross, 1991). However, the use of TPB to explore the determinations of nutrition field, especially dietary supplement use is a new application of the model (Conner et al., 2001).

Several meta-analyses have reviewed TPB in different constructs (Albarracín, Johnson, Fishbein & Muellerleile, 2001; Armitage & Conner, 2001). Generally, these meta-analyses have confirmed the relationships specified by the TPB approach. Significant findings indicated that attitudes and perceived behavioural control have

positive and strong relationship with intentions. According to Albarracin et al. (2001), subjective norms may have some or little impact on intentions. Moreover, intentions and perceived behavioural control are positively related to behaviours. Referring to Armitage and Conner (2001), TPB components accounted for 39% and 27% of the variance in intentions and behaviours respectively.

One major assumption of the TPB is that attitudes guide behaviour (Ajzen & Fishbein, 2005). It assumed that human behaviour is reasoned and that individual considers the likely consequences of performing or not performing that behaviour. Intentions are conceived of as plans to act in a particular way and represent the motivation toward the behaviour. Attitudes represent overall evaluations of the behaviour as positive or negative for that individual. Subjective norms assess the perceived social pressures to perform or not perform a particular behaviour, it involves an individual's perception of what significant others believe about his or her ability to perform the behaviour. Meanwhile the perceived behavioural control is the individual's perception of the extent to which performance of the behaviour is easy or difficult.

This three variables, attitudes, subjective norms and perceived behavioural control are held together to determine intentions to performance. Therefore, we can make a simple conclusion that individuals are more likely intend to perform behaviour if they have a positive attitude towards it, perceive social pressure from others to perform the behaviour and perceive that performance of the behaviour is within their control.

2.4 An Extended Version of Theory of Planned Behaviour

Several authors have proposed that there is a need to modify the TPB model. Shepherd and O’Keefe (1984); Shimp and Kavas (1984); Vallerand, Deshaies, Cuerrier, Pelletier, and Mongeau (1992); and Chang (1998) have all found evidence that there is a significant causal path from subjective norms to attitudes, neglected in prior studies. All these cases, where subjective norms and attitudes were related to each other, dealt with some kind of ethical or moral decision making, but also in the case of personal benefits. Chang (1998) studied and tested the correlation of subjective norms and attitudes towards behaviour. The path from subjective norms to attitudes towards behaviour was significant; as a result, Chang (1998) suggested that the relationship could be explained by social environment’s influence on individuals’ attitudes.

2.4.1 Perceived Availability

According to Ajzen (2002), perceived behavioural control can account for considerable variance in behavioural intentions and actions. Perceived behavioural control can be further divided into two components: perceived self efficacy, which refers to ease or difficulty of performing the behaviour, and perceived controllability, which refers to the extent to which performance depends on the actor. The past research on organic food consumption (Tarkiainen & Sundqvist, 2005) has shown that the most important reasons for not buying organic food are lack of availability. The lack of availability as an obstacle for buying is clearly not under consumers’ control, it depends on the supply chain.

2.4.2 Importance of Price

The other type of behavioural control, perceived self efficacy is more complex. As perceived controllability deals with consumers' external control to buy, the perceived self efficacy deals with consumers' internal control to buy (Conner & Armitage, 1998). Perceived self efficacy focus on individuals' own abilities to perform the behaviour, not the environmental or external obstacles. Terry and O'Leary (1995) analyzed the constructs of self efficacy and perceived behavioural control in different context. Their analysis revealed that regarding individuals' exercise behaviour; self efficacy predicted intentions and perceived behavioural control predicted exercise behaviours.

Meanwhile the previous study, de Vries, Dijkstra and Kuhlman (1988) supported the use of self efficacy to predict both intentions and behaviour. Ajzen (2002) indicates that the concept of perceived behavioural control is similar to self efficacy in social cognitive theory (Bandura, 1997). However, Armitage and Conner (2001) supported the difference of self efficacy and perceived behavioural control over behaviours. Armitage and Conner's meta-analysis showed that self efficacy and perceived behavioural control had a comparable level of correlation with both intentions and behaviours, with multiple correlation coefficient of 0.40. Moreover, perceived behavioural control and self efficacy managed to explain additional 5% of variance in intentions and 2% in behaviours.

Self efficacy contributed 7% of the variance explained in intentions and approximately 2% of additional variance explained in behaviour. Jackson, Smith and

Conner (2003) found out that self efficacy was a significant predictor of individuals' intentions to exercise and perceived behavioural control did not predict intentions. On the other hand, Hagger, Chatzisarantis and Biddle (2002) revealed that perceived behavioural control and self efficacy have separated influences on intentions to participate in physical activity.

Hence, it can be assumed that the price of dietary supplements is more of the perceived self efficacy type of control. Higher price may be an obstacle, especially for low income group consumers to make a purchase (Tarkiainen & Sundqvist, 2005).

Perceived cost refers to the barriers or losses that interfere with health behaviour change. The combination of perceived effectiveness and perceived costs constitute the notion of outcome expectation. Belief alone is not enough to motivate an individual to carry out an action. Taking action involves cognitively weighing the personal costs associated with the behaviour against the benefits expected as a result of engaging in the behaviour. Benefits have to outweigh the costs involved (Redding et al., 2000). Thus, present study suggests a hypothesis of importance of price influences the attitude towards intention to purchase dietary supplements.

2.4.3 Health Consciousness

Several authors have commented on the fact that the TPB fails to adequately consider perceptions of risk or susceptibility which are common in other models of